REMARKS

I. Status of Claims

Claims 2-8 are pending in this application. By this Amendment, claims 2-4 and 6 have been amended. Reconsideration is respectfully requested in view of the above amendments and the following remarks.

II. Rejections under 35 U.S.C. §112

Claims 2, 4, and 6 have been rejected under 35 U.S.C. §112, second paragraph because the q-model has not been described with specificity. Claims 2, 4, and 6 have been amended to overcome this rejection. Instead of "q-model", the claims have been amended to incorporate the use of a trader-selected parameter "q" or "selectable q parameter". This is amendment is supported by the specification as set forth on page 1, lines 21-23. Mathematical techniques are known in the financial and other arts that implement a selectable "q". Withdrawal of the rejection is therefore respectfully requested.

Claim 3 has been rejected under 35 U.S.C. §112 because the Office Action alleges that "employing a volatility premium process" is vague. Accordingly, claims 3 and 6 have been amended to incorporate a "volatility premium calculation equation". This amendment is supported for example, by page 4, lines 12-22 of the present specification. Applicants respectfully submit that this Amendment renders the claims clear and definite. Withdrawal of the rejection is therefore respectfully requested.

III. Rejection of claim 3 under 35 U.S.C. §103

Claims 3 has been rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,263,321 to Daughtery in view of a book by Neil A. Chriss entitled "Black Scholes and

Beyond. Option Pricing Models" (hereinafter "Chriss")and in further view of Financial Engineering News (hereinafter "FEN")and Official Notice. This rejection is respectfully traversed.

Even in combination with Chriss, FEN, and Official Notice, Daughtery would not have arrived at the invention of claims 3 and 6.

Claim 3 requires a method for generating a premium for an option. The method requires providing the average volatility of the asset by employing historical or market data and providing the volatility of volatility of the asset by employing historical data. Claim 3 further requires providing the type of distribution for the forward rate based on historical data and providing a volatility distribution graph based on the selected distribution type. Claim 3 further requires dividing the volatility distribution graph into a plurality of vertical slices, each of said slices corresponding to a volatility, whereby the integration of the graph over the volatility range corresponding to each slice provides a probability for the corresponding volatility. Additionally, claim 3 requires determining an option premium for each vertical slice by employing a volatility premium calculation equation, weighing each premium by the probability associated with the corresponding volatility as determined from the volatility distribution graph, and summing all weighed premiums associated with the volatilities to provide a premium for the option. Finally, claim 3 requires performing an inverse Black procedure to determine the conventional market implied volatility for a strike rate that is different from the forward rate.

Daughtery discloses the familiar Black-Scholes algorithm (see Daughtery, col 11, lines 32-49), which was discussed by Applicants in the background of the invention. Black Scholes is a function of volatility of rates and assumes a constant volatility.

Daughtery fails to disclose several features of independent claim 3 including at least: (1) providing the volatility of volatility of the asset by employing historical data; (2) providing the type of distribution for the forward rate based on historical data; (3) providing a volatility distribution graph based on the type of distribution and dividing the volatility distribution graph into a plurality of vertical slices, each of said slices corresponding to a volatility; (4) determining an option premium for each vertical slice by employing a volatility premium calculation equation; (5) weighing each premium by the probability associated with the corresponding volatility as determined from the volatility distribution graph; (6) summing all weighed premiums associated with the volatilities to provide a premium for the option; and (7) performing an inverse Black procedure to determine the conventional market implied volatility for a strike rate that is different from the forward rate.

With respect to (1) providing the volatility of volatility of the asset by employing historical data, the Office Action admits on page 4, last full paragraph that Daughtery fails to disclose this feature, but alleges that it would have been obvious to incorporate this feature, since the feature is known as illustrated by Chriss. Despite the admission that Daughtery fails to disclose volatility of volatility, the Office Action alleges that Daughtery discloses the features set forth below, most of which require a volatility variation in order to be implemented or even to be contemplated.

With respect to (2) providing the type of distribution for the forward rate based on historical data, the Office Action alleges that this feature is shown in Col 7, lines 1-7 and column 9, lines 37-40 of Daughtery. Applicants respectfully submit that this reliance is misplaced as these sections introduce neither a forward rate nor a type of distribution.

With respect to (3) dividing the volatility distribution graph into a plurality of vertical slices, each of said slices corresponding to a volatility, the Office Action relies on Column 11, lines 34-60 of Daughtery to show this feature. However, Daughtery fails to disclose this feature. The Office Action alleges that the integration of the graph over the volatility range corresponding to each slice provides a probability for the volatility. However, the integration over the volatility range merely provides the entire area under the curve and does not contemplate dividing the volatility distribution graph into a plurality of vertical slices, wherein each slice corresponds to a volatility. Daughtery merely discloses the Black Scholes algorithm for calculating an option premium. Furthermore, the summation in Daughtery is over "n", which is the number of periods until expiration for an expiring option, not over multiple volatilities. The single volatility variable is represented by "S" in Daughtery. The volatility "S" in Daughtery is assumed to be constant. Therefore, Daughtery does not even disclose a "volatility range" and most certainly fails to disclose dividing a volatility graph into a plurality of vertical slices, wherein each slice corresponds to a volatility.

With respect to (4) determining an option premium for each vertical slice by employing a volatility premium calculation equation, as set forth above, since Daughtery assumes constant volatility, there can be absolutely no disclosure in Daughtery for determining an option premium for each vertical slice by employing a volatility premium calculation equation.

Similarly, with respect to (5) weighing each premium by the probability associated with the corresponding volatility as determined from the volatility distribution graph; and (6) summing all weighed premiums associated with the volatilities to provide

a premium for the option, the assumption of constant volatility in Daughtery negates any possibility of disclosure of these features.

With respect to (7) performing an inverse Black procedure to determine the conventional market implied volatility for a strike rate that is different from the forward rate, the Office Action alleges that since it is known to perform an inverse Black procedure, it would have been obvious to implement this procedure in the system of Daughtery in order to yield smooth volatility surfaces. However, this objective is accomplished merely by assuming constant volatility as is currently done with the Black Scholes method. Daughtery already achieves this goal and cannot possibly "invert" an equation it has already implemented to achieve a result that it has already reached without any inversion.

With respect to the secondary references, Chriss illustrates that stochastic volatility is known. FEN also illustrates that volatility may be viewed as a surface rather than as a constant. However, these references fail to obviate the deficiencies set forth above. Even if Daughtery were modified to consider stochastic volatility or "volatility of volatility", the references provide insufficient teaching to arrive at the method set forth in claim 3. In summary, the Office Action fails to establish a *prima facie* case of obviousness. Specifically, before considering what would be obvious to one of ordinary skill in the art at the time of the invention, the art must teach or suggest the claim limitations. See MPEP §2143. Thus, even if combined, the references fail to render obvious claim 3. The Office Action further rejects claim 6 on the same grounds alleging that it has similar limitations. Claim 6 defines over the art of record for the reasons set

forth above with respect to claim 3. Accordingly, withdrawal of the rejection of claims 3 and 6 under 35 U.S.C. §103 is respectfully requested.

IV. Request for Information under 37 C.F.R. §1.105

The Office Action requests references to textbooks or publications where the equation of Claims 2, 4, and 7 can be found. Applicants respectfully submit that the equation of claims 2, 4, and 7 is derived from existing equations and thus, the applicants are naturally unaware of any textbooks or publications where the equation can be found. As set forth on page 3, lines 9-12, the method expands on the known Hull and White model by creating a lognormal distribution of volatility instead of variance. Furthermore, the method is implemented by incorporating the trader-selected parameter "q". Thus, applicants have provided additional background material in an attempt to comply with the request by including the articles that are attached and listed on the enclosed Information Disclosure Statement.

V. Conclusion

As set forth above, applicant respectfully submits that all claims are in condition for allowance. Withdrawal of all rejections and prompt passage to issuance are earnestly requested. In the event Applicants have overlooked the need for an extension of time, payment of fee, or additional payment of fee, Applicants hereby petition therefore and authorize that any charges be made to Deposit Account No. 50-4494.

Should the Examiner have any questions regarding any of the above, the Examiner is respectfully requested to telephone the undersigned at 202-346-4016.

Respectfully submitted,

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